



California Energy Commission

Committee Workshop

POTENTIAL APPLIANCE EFFICIENCY
REGULATIONS FOR
GENERAL SERVICE AND REFLECTOR
INCANDESCENT
LAMPS AND METAL HALIDE LUMINAIRES

July 18, 2005



Potential Appliance Efficiency Regulations

- General Service Incandescent Lamps
 - Frost or Clear
 - Soft White
 - Enhanced Spectrum
- Reflector Incandescent Lamps
- Metal Halide Luminaires



Overview

- Order Adopting Regulations and Directing Additional Rulemaking Activities
- Alternative 2 adopted
- Marketing partnerships
- Collaborative discussions with industry



General Service Incandescent Lamps

- “Tier 1” requirements adopted for frost or clear, and soft white general service incandescent lamps
- Adopted on December 15, 2004
- Effective Date January 1, 2006
- Not Adopted
 - Enhanced Spectrum
 - Vibration Service



General Service Incandescent Lamps

- Rationale behind ramps
- Consumers purchase watts
- Goal: Reduce Energy, Increase Efficacy, Maintain Lamp Life



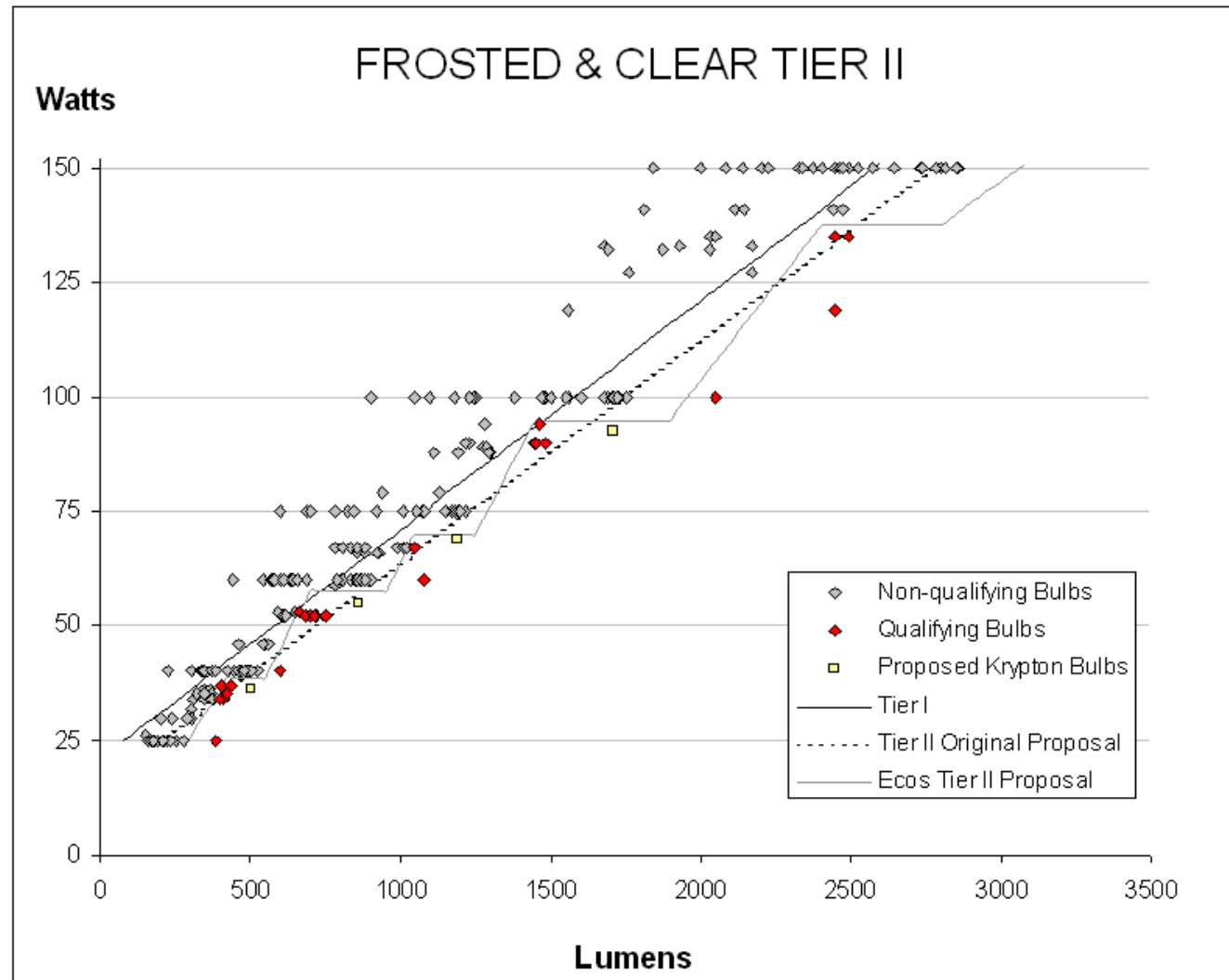
Examples For 60-Watt Soft White

Current Lumens	Efficacy	Increase in Efficacy at 57 Watts (Same Lumens)	Increase in Efficacy at 60 Watts, 967 Lumens
780	13	13.7 (5.3%)	16.1 (24%)
800	13.3	14 (5.3%)	16.1 (20.9%)
840	14	14.7 (5.3%)	16.1 (15.1%)
865	14.4	15.2 (5.3%)	16.1 (11.8%)



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Figure 3: Frosted and Clear Bulbs





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Table K-3
Standards for General Service Incandescent Lamps

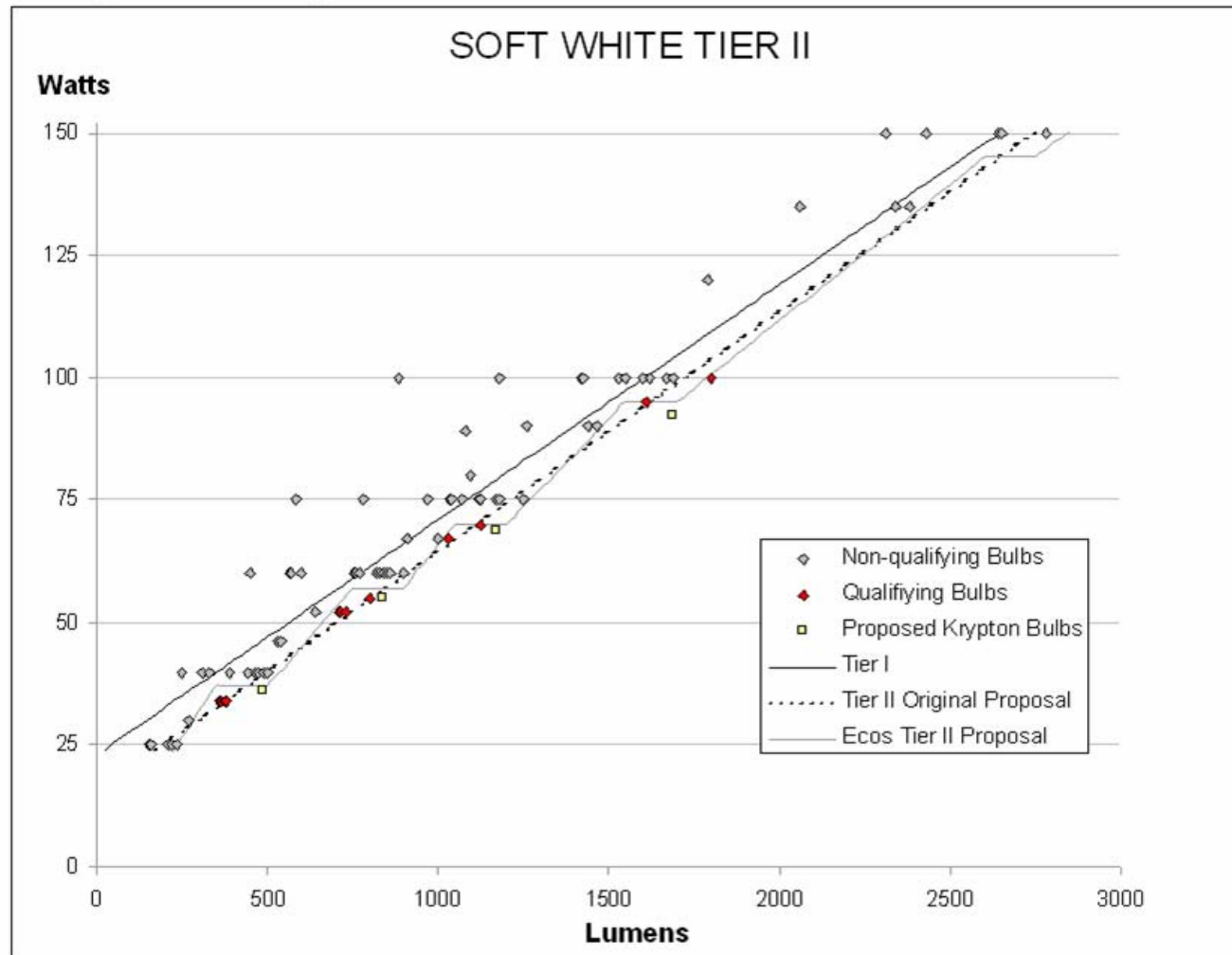
1		2	3
Lamp Type		Maximum Power Use (Watts)	Maximum Allowed Wattage (W) as a Function of Lumens (L)
	Lumens (L)	January 1, 2006	Potential Standards for January 1, 2008
Frost or Clear	$L \leq 400$	(0.0500 * Lumens) + 21 [The standards in this column were adopted by the Energy Commission on December 15, 2004.]	$W = \frac{35}{400} L$
	$400 < L \leq 550$		$W = 38.5$
	$550 < L \leq 700$		$W = \frac{19}{150} (L - 700) + 57.5$
	$700 < L \leq 950$		$W = 57.5$
	$950 < L \leq 1050$		$W = \frac{3}{25} (L - 1050) + 70$
	$1050 < L \leq 1250$		$W = 70$
	$1250 < L \leq 1450$		$W = \frac{1}{8} (L - 1450) + 95$
	$1450 < L \leq 1900$		$W = 95$
	$1900 < L \leq 2400$		$W = \frac{17}{200} (L - 2400) + 137.5$
	$2400 < L \leq 2800$		$W = 137.5$
	$2800 < L$		$W = \frac{97}{2000} (L - 3000) + 143.8$





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Figure 2: Soft White Light Bulbs





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Table K-3
Standards for General Service Incandescent Lamps

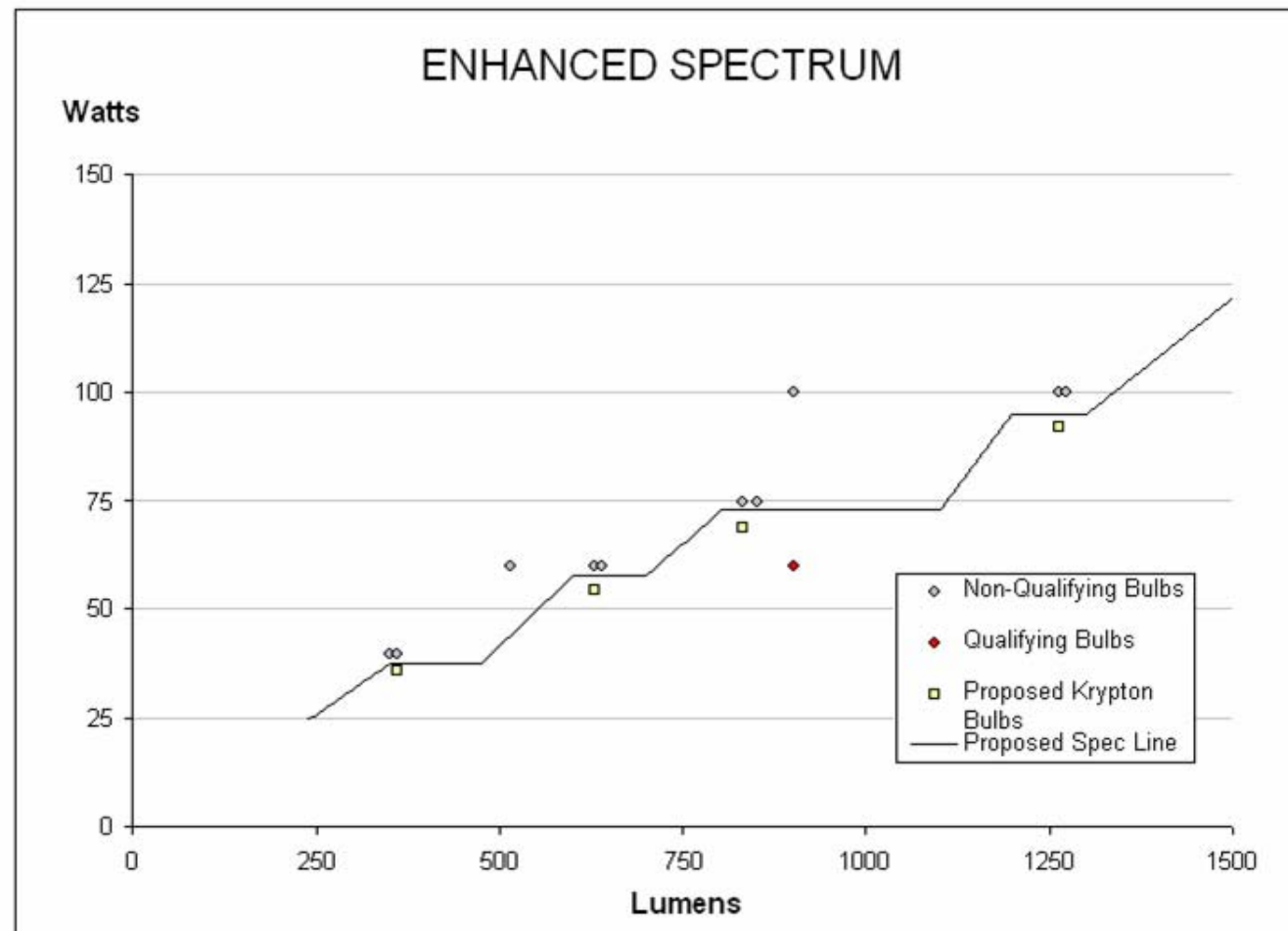
1		2	3
<i>Lamp Type</i>		<i>Maximum Power Use (Watts)</i>	<i>Maximum Allowed Wattage (W) as a Function of Lumens (L)</i>
	<i>Lumens (L)</i>	<i>January 1, 2006</i>	<i>Potential Standards for January 1, 2008</i>
Soft White	$L \leq 350$	(0.0480 * Lumens) + 23 [The standards in this column were adopted by the Energy Commission on December 15, 2004.]	$W = \frac{37}{350} L$
	$350 < L \leq 500$		$W = 37$
	$500 < L \leq 750$		$W = \frac{20}{250} (L - 750) + 57$
	$750 < L \leq 900$		$W = 57$
	$900 < L \leq 1050$		$W = \frac{13}{150} (L - 1050) + 70$
	$1050 < L \leq 1200$		$W = 70$
	$1200 < L \leq 1550$		$W = \frac{25}{350} (L - 1550) + 95$
	$1500 < L \leq 1700$		$W = 95$
	$1700 < L \leq 2600$		$W = \frac{50}{900} (L - 2600) + 145$
	$2600 < L \leq 2750$		$W = 145$
	$2750 < L$		$W = \frac{145}{2750} L$





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Figure 4 – “Enhanced Spectrum” Bulbs





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Table K-3
Standards for General Service Incandescent Lamps

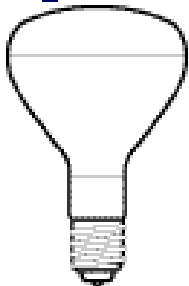
1		2	3
Lamp Type		Maximum Power Use (Watts)	Maximum Allowed Wattage (W) as a Function of Lumens (L)
	Lumens (L)	January 1, 2006	Potential Standards for January 1, 2008
Enhanced Spectrum	$L \leq 350$	No Requirement	$W = \frac{7}{60}(L - 350) + 37.5$
	$350 < L \leq 475$		$W = 37.5$
	$475 < L \leq 600$		$W = \frac{4}{25}(L - 600) + 57.5$
	$600 < L \leq 700$		$W = 57.5$
	$700 < L \leq 800$		$W = \frac{3}{20}(L - 800) + 72.5$
	$800 < L \leq 1100$		$W = 72.5$
	$1100 < L \leq 1200$		$W = \frac{9}{40}(L - 1200) + 95$
	$1200 < L \leq 1300$		$W = 95$
	$1300 < L$		$W = \frac{2}{15}(L - 1450) + 115$





State-Regulated Incandescent Reflector Lamps

- Not adopted on December 15, 2004
- Alternative 1 had implementation date of January 1, 2006
- Effective date delayed until January 1, 2007
- Lowest wattage changed from 40 to 41 watts
- 50ER30 lamps exempted





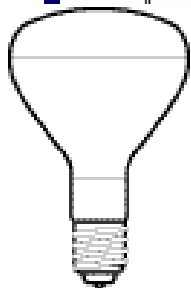
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(K) Lamps (3) Standards for State-Regulated Incandescent Reflector Lamps.
The average lamp efficacy of state-regulated incandescent reflector lamps manufactured on or after January 1, 2007 shall be not less than the applicable values shown in Table K-4.

EXEMPTION: 50ER30 (50 watt ellipsoidal reflector, 3.75" diameter) lamps.

Table K-4
Standards for State-Regulated Incandescent Reflector Lamps

Rated Lamp Wattage	Minimum <u>Average Lamp Efficacy</u> (LPW)
41-50	10.5
51-66	11.0
67-85	12.5
86-115	14.0
116-155	14.5
156-205	15.0





Metal Halide Luminaires

- Luminaires with 150-500 watt vertically mounted metal halide lamps shall not contain probe-state metal halide ballasts
- Adopted December 15, 2004
- Effective Date January 1, 2006
- “Tier 2” not adopted





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(n)(2) Energy Efficiency Standard for Metal Halide Luminaires. Metal halide luminaires, manufactured on or after the effective dates shown in Table N-1, shall meet the requirements shown in Table N-1.

Table N-1
Standards for Metal Halide Luminaires

Lamp Position	Lamp Rating	Effective Date	Requirements
Vertical	150-500 Watts	January 1, 2006	Luminaires shall not contain a probe-start metal halide ballast [adopted 12/15/04].
All	150-500 Watts	January 1, 2008	Luminaires shall not contain a probe-start metal halide ballast.
All	150-200 Watts	January 1, 2008	Luminaires (except "exempted outdoor luminaries" and luminaries operating at 480V) shall contain a metal halide ballast with minimum lamp/ballast system efficiency = $(0.0002 * \text{Lamp Watts}) + 0.864$
All	201-500 Watts	January 1, 2009	Luminaires (except "exempted outdoor luminaries" and luminaries operating at 480V) shall contain a metal halide ballast with minimum lamp/ballast system efficiency = $(0.0002 * \text{Lamp Watts}) + 0.864$

